

REMARKS

Claim 2 has been cancelled so that claims 1, 3-11, 13-15, 17-19 and 23-44 remain in the application. Claims 5, 6, 11, 13, 14 and 23-44 have been withdrawn from consideration.

The Examiner objected to the specification on the basis that the abstract of the disclosure is not directed to the claimed invention. The abstract of the disclosure has been amended to encompass the method of the invention as required by the Examiner.

The Examiner also objected to the title of the invention on the basis that it is not descriptive. The title has been amended to the title suggested by the Examiner.

The Examiner objected to claim 15 on the basis that the phrase --of the second pole tip-- should be added after "stitch region" in line 4 of claim 15. Claim 15 has been amended as suggested by the Examiner.

Claims 10, 15, 17 and 19 were rejected under 35 USC 112, second paragraph, as being indefinite on the basis that the phrase "the first pole piece layer" in line 2 of claim 10 lacks positive antecedent basis. Claim 10 has been amended to recite the forming of a first pole piece layer of a first pole piece so as to provide proper antecedent basis.

The Examiner indicated that claims 7-9 would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims. Claims 7-9 have been so amended and should now be in condition for allowance.

The Examiner indicated the allowability of claims 10, 15 and 17-19 if rewritten to overcome the rejections under 35 USC 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims. Claim 10, which is a parent claim to claims 15 and 17-19, has been amended to overcome the rejections under 35 USC 112, second paragraph, as discussed hereinabove, and has been further amended to include all the limitations of the base claim and any intervening claims. Accordingly, claims 10, 15 and 17-19 should now be in condition for allowance.

Claim 1 was rejected under 35 USC 102(b) as being anticipated by Chang. Amended claim 1 is distinguished over Chang by reciting:

"the top surface of the second pole tip having a write region located at the ABS site and a stitch region which is recessed in its entirety from the ABS site toward said back gap;

depositing a protective sacrificial layer on the write and stitch regions of the second pole tip;

removing said sacrificial layer from only the stitch region of the second pole tip; and

forming a second pole piece yoke of a second pole piece magnetically connected to the stitch region of the second pole tip."

Amended claim 1 is a generic claim which reads upon the embodiments shown in Figs. 14 and 17 of Applicant's drawings. The method of constructing the embodiment shown in Fig. 14 is illustrated in Figs. 11-13 which is described in Applicant's specification, page 12, lines 9-26 which state:

" . . . In Fig. 11, a thick layer of alumina 240 is deposited over the wafer with a thickness greater than the thickness of the write coil layer 220 and a thickness of the second pole tip 214 filling in a remainder of the turns of the write coil 220. In Fig. 12 CMP is employed for polishing the alumina layer 240 in Fig. 11 until the insulation layer 226 is formed flat a distance above the top of the second pole tip 214 and optionally above the top of the write coil 220. Important in this step is that the CMP be terminated before it touches the top surface of the second pole tip 214 so that a portion of the insulation layer 226 remains thereon. In Fig. 13 an insulation layer 227 may be deposited and the insulation layers 226 and 227 are etched to expose the stitch region 234 of the second pole tip. In Fig. 14 the second pole piece yoke 216 is magnetically connected to the second pole tip at the stitch region 234 and is extended over the insulation layer 226 above the write coil 220. An overcoat layer 242 may be subsequently formed.

It should be noted that the insulation layer 226 protects the pole tip region 233 when a seed layer for the yoke 216 is removed by etching and studs are formed for terminals for the read and write head portions of the head. Fig. 14A is an ABS illustration of the magnetic head shown in Fig. 14."

In this embodiment the sacrificial insulation layer 226 is removed only in the stitch region 234, as shown in Fig. 13, leaving a portion of the sacrificial insulation layer 226 covering the write region of the P2 tip during subsequent processing steps. The method of making the embodiment shown in Fig. 17 is shown in Figs. 15 and 16 and is described on page 12, lines 15-30 of Applicant's specification, which state:

"Important steps in fabrication of the head 300, shown in Fig. 17, are shown in Figs. 15 and 16. In Fig. 15 a thick layer of alumina 308 is deposited over the entire wafer. In Fig. 16 the alumina layer is CMP until a top surface of the pedestal 234 (stitch region) and the top surfaces of the write coil layer 220 are exposed with these surfaces and a top surface of an alumina layer 310 being planar, as shown in Fig. 16. However, the CMP is terminated before a remaining layer portion 310 of the alumina is removed from the write portion 232 of the second pole tip. It should be noted in this embodiment that the alumina layer fills in between the coils of the write coil 220 and that the baked photoresist layer 224 in Fig. 14 is omitted. In Fig. 17 the yoke 216 is formed magnetically connected to the exposed pedestal 234 of the second pole tip and magnetically connected to the back gap pedestal 304. Before depositing the yoke 216 a baked photoresist layer 312 (I5) may be formed on top of the write coil 220 for insulating it from the yoke 216. Again, it should be noted that the insulation layer portion 310 at the write portion 232 has protected the height of the second pole tip from the yoke seed layer removal and subsequent construction of studs (not shown) to terminals of the read and write head portions of the head 300."

Again, the sacrificial insulation layer is removed from only the stitch region 234, as shown in Fig. 16, leaving a sacrificial insulation layer portion 310 protecting a write portion of the P2 tip. The remaining sacrificial insulation portion 232 protects the write portion of the P2 tip from subsequent processing steps. Amended claim 1 also reads upon the embodiments shown in Figs. 18 and 19. Amended claim 1 is distinguished over Chang by reciting the deposition of the protective sacrificial layer on the write and stitch regions of the second pole tip and removing the sacrificial layer from only the stitch region of the second pole tip. Chang discusses his method in column 9, lines 6-16 which state:

".... The second pole tip 142 is then plated and the photoresist layer 171 is removed as shown in FIG. 19. It should be noted that the one or more insulation layers 171 will not cause reflective notching of the pole tip region since the light exposure is confined to the planar region of the first insulation layer 132. An ABS view of FIG. 18 will look like FIG. 17.

In FIGS. 20 and 21 there is shown an ion milling step for notching the first pole piece at 172 and 174. The first component 142 is employed as a mask for ion milling the first pole piece to create the notching."

After Chang constructs his pole tip 142, as shown in Fig. 19, he ion mills in Fig. 20 to notch the second shield/first pole piece layer 60/72. There is no step taught by Chang of protecting the second pole tip 142 from this ion milling or any subsequent processing steps. After constructing the second

pole tip 142, as shown in Fig. 19, Chang conducts subsequent processing steps, including the formation of the insulation stack followed by stitching the portion 184 of the second pole piece to the pole tip 182, as shown in Fig. 22.

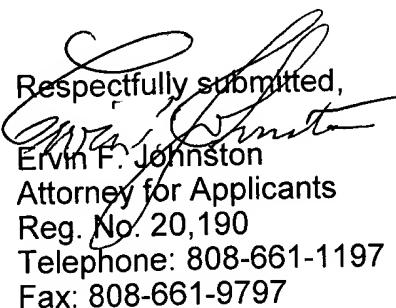
Claims 1-3 were rejected under 35 USC 103(a) as being unpatentable over Stageberg. In support of his rejection the Examiner states:

"Regarding Claim 2, Stageberg further teaches removing the sacrificial layer 30 from the entire top surface of the second pole tip (see sequence of Figs. 6 and 7). The benefits of the sacrificial layer 30 of Stageberg in the first embodiment form an art recognized equivalent insulator and coil structure between the first and third embodiments. It is further noted that deposition of the sacrificial layer 30 on the entire top surface of the second pole tip 28 in the first embodiment would be inclusive of the entire top surface, i.e. stitch region and write region, of the second pole tip 108 in the third embodiment."

As acknowledged by the Examiner, Stageberg teaches removing the sacrificial layer 30 from the entire top surface of the second pole tip, as shown in Figs. 6 and 7 of Stageberg. Claim 1 is clearly distinguished over Stageberg by reciting the removal of the sacrificial layer from only the stitch region of the second pole tip, as shown in Figs. 13 and 16 of Applicant's drawings and as described hereinabove. Claim 3, which is dependent upon claim 1, is considered to be patentable over Stageberg for the same reasons as given in support for claim 1.

Claim 4 was rejected under 35 USC 103(a) as being unpatentable over Stageberg in view of Chang. Claim 4, which is dependent upon claim 3, is considered to be patentable over these references for the same reasons as given in support for claim 3.

Should the Examiner have any questions regarding this document he is respectfully requested to contact the undersigned.


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